

1380

2

MAY 19 1960

FELT-COTE DIVISION • AMERICAN STEEL BAND COMPANY • PITTSBURGH, PA.

FACTORY-APPLIED SEALING COAT

ASBESTOS FELT, ASPHALT-IMPREGNATED

ASPHALT

STEEL

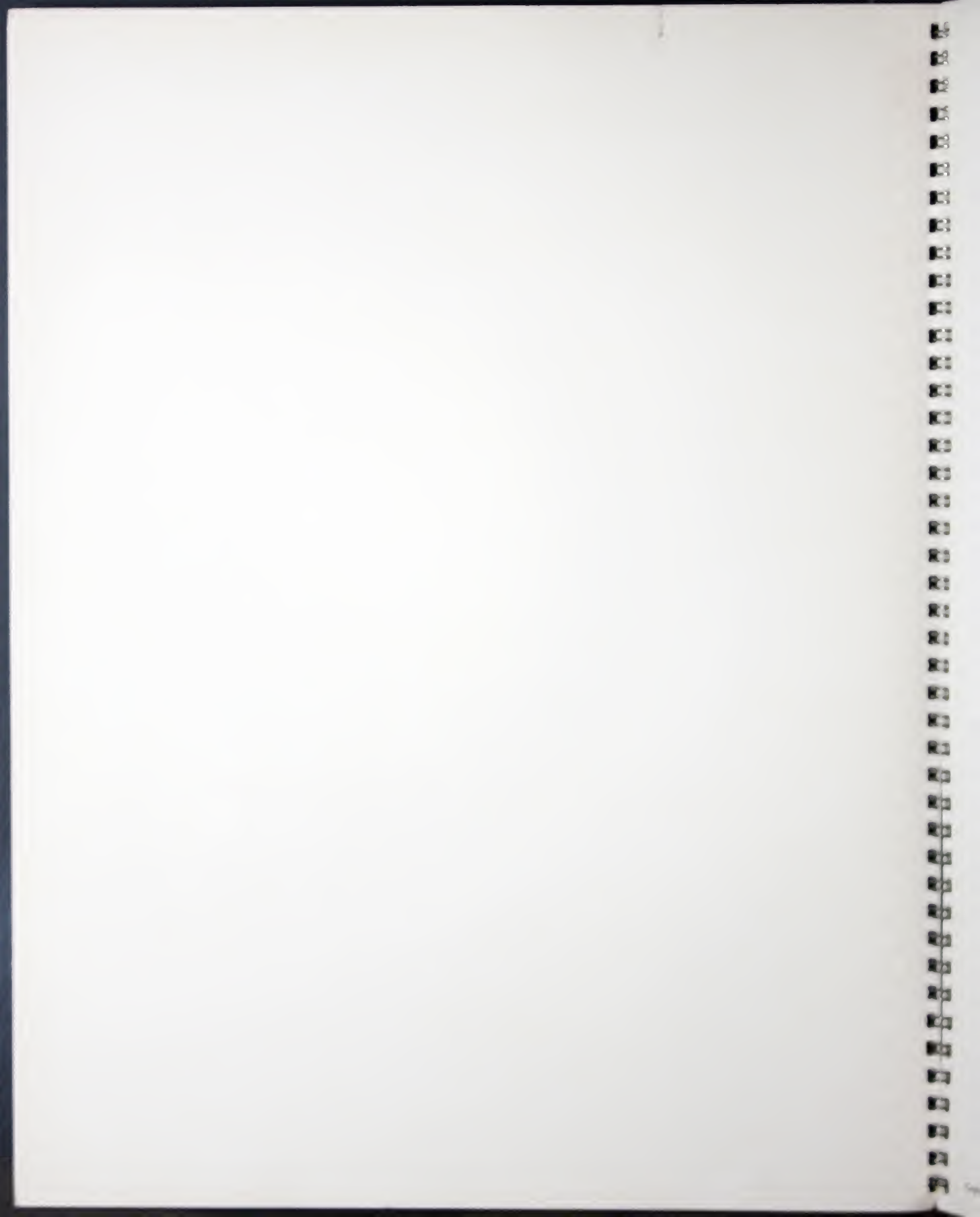
Felt-Cote

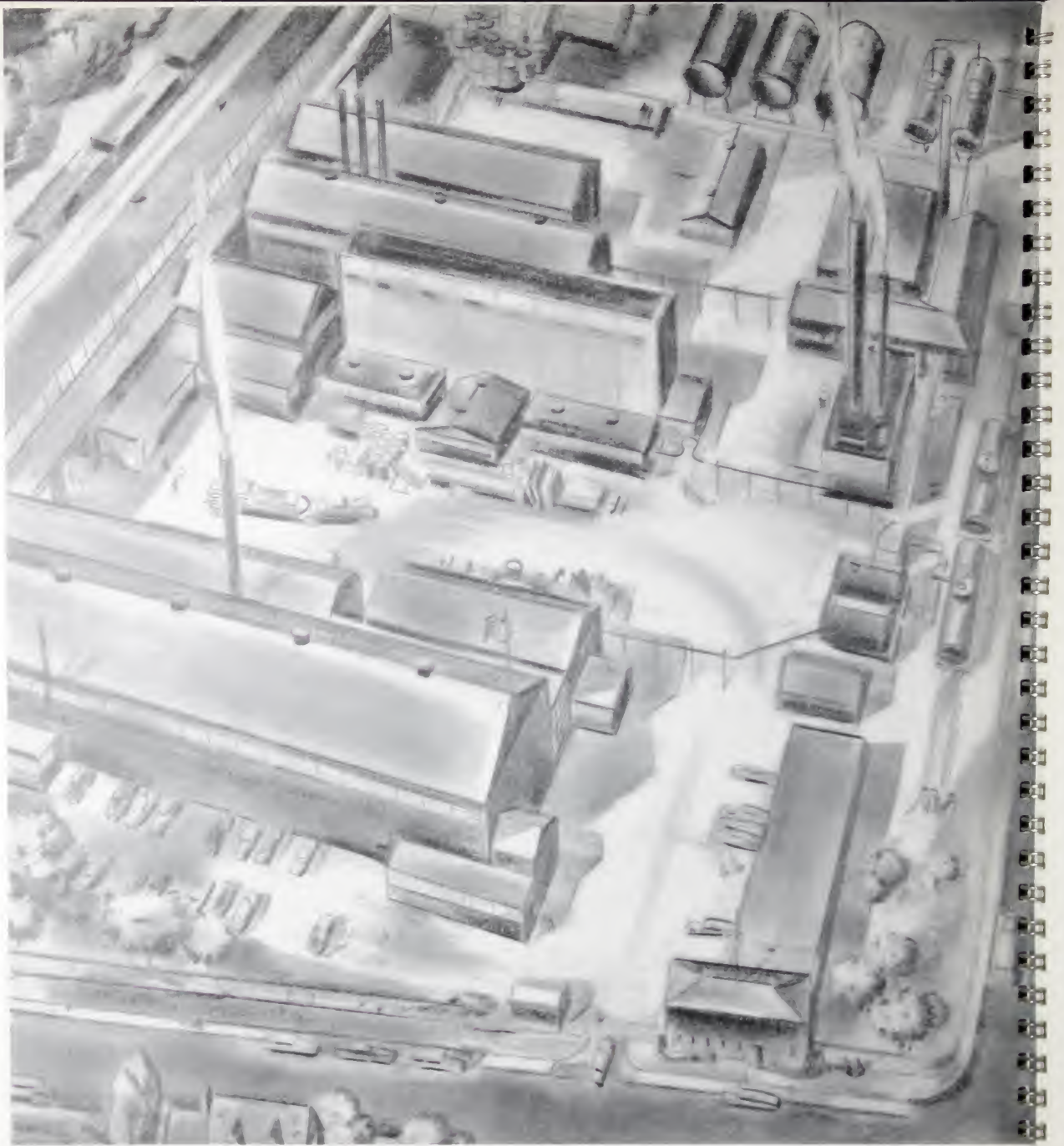
ASBESTOS - PROTECTED METAL

ROOFS & SIDING

THE FRANKLIN INSTITUTE

LIBRARY





● American Steel Band Company—FELT-COTE Plant.

EVERY ROOF CUSTOM BUILT

Felt-Cote



ROOFS & SIDING

for

INDUSTRIAL BUILDINGS

Hangars • Airplane Assembly Shops and Repair Docks
Munitions Works • Ordnance Plants • Supply Depots
and Warehouses — other structures of large area

AMERICAN STEEL BAND CO.

Sales Offices, PITTSBURGH, PA.

Established 1891

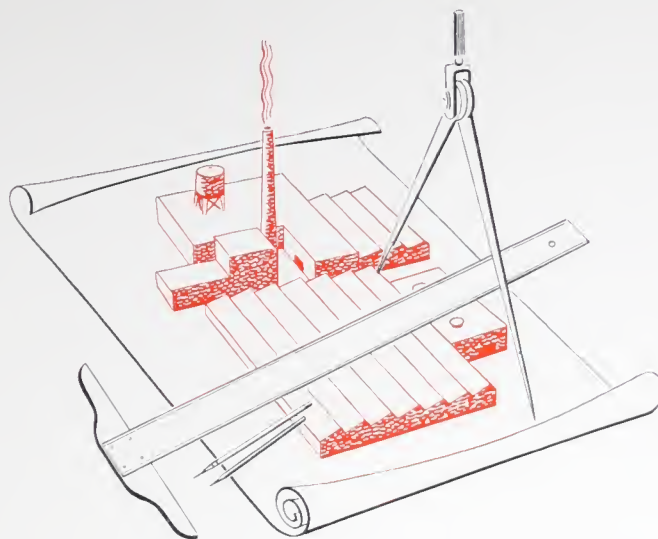
Plant, Carnegie, Pa.



● Looking up at FELT-COTE from inside a Government Hangar.

(Opposite page)

- Top: Same Hangar as above.
- Bottom: Warehouse of internationally known food concern—110,000 square feet of FELT-COTE.



History of Felt-Cote

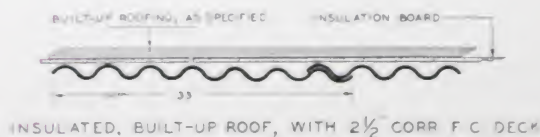
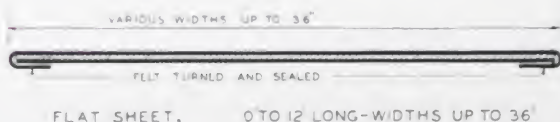
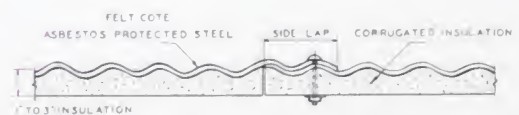
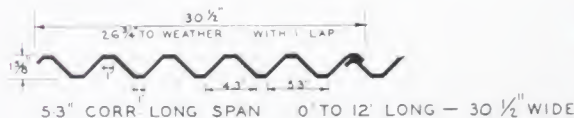
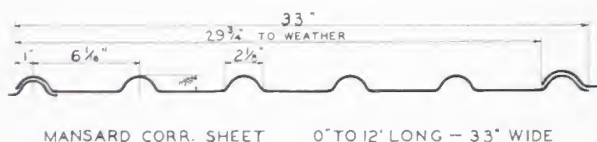
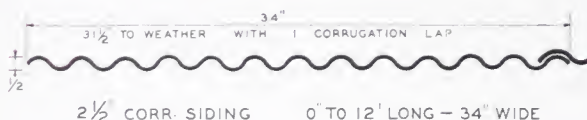
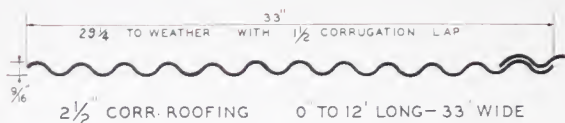
FELT-COTE roofs and siding cover important industrial and Government-owned buildings in all parts of the United States and in remote places abroad, under all extremes of climate—hot and cold, wet and dry—and under widely varying conditions of use. A few such buildings are illustrated here.

Made by carefully controlled processes, of approved materials, FELT-COTE meets all standard Government specifications for asbestos-protected metal roofing and siding.

Where ordinary corrugated steel is too short-lived, the advantages of FELT-COTE are most apparent. It was with such uses in view that FELT-COTE was developed, and from the earliest installations to the present, it has always won approval on the score of durability. The average anticipated service of FELT-COTE, as exposed in industrial surroundings, is more than twenty years. Under many conditions, it will outlast the usefulness of the building to which it is applied.



Sections of Felt-Cote Sheets



CORRUGATED ROOFING

FELT-COTE roofing sheets with 2 1/2" corrugations are recommended for roofs having a pitch of 2" or more in 12", purlin spaces being not more than 7' 6". Sheets are 33 inches wide, laid 29 1/4 inches to the weather, with a lap of 1 1/2 corrugations as shown. Offered in lengths up to 12 feet, standard lap, 6 inches.

CORRUGATED SIDING

FELT-COTE siding sheets with 2 1/2" corrugations are suitable for buildings where girt spacing does not exceed 8' 3". Sheets are 34 inches wide and are laid 31 1/2 inches to the weather, with a lap of one corrugation, as shown. Available in any length up to 12 feet, standard end lap, four inches.

MANSARD SHEETS

FELT-COTE Mansard sheets are used for roofing, siding, or partitions where special architectural effects are sought. Corrugations are 6 1/16" from center to center. Sheets 33 inches wide, laid 29 3/4" to the weather, with side lap of one corrugation. Can be had in lengths up to 12 feet. Standard end lap, six inches for roofs, four inches on side walls or partitions.

LONG-SPAN SHEETS ("V" type or trough type).

Deep-corrugated sheets, giving extra rigidity for long-span applications, are recommended to provide for extra-heavy roof loads or high wind pressures, or to justify lessening the weight and dimensions of the supporting frame. Corrugations are approximately 1 3/4" deep, 5.3" between centers. Sheets are 30 1/2 inches wide, laid 26 3/4 inches to the weather, and of any length up to 12 feet, and standard end laps are 6 inches for roofing, 4 inches for siding. Purlin spaces not over 10 feet.

APMI INSULATED SHEET

For a high degree of insulating effectiveness without excessive weight or cost, the APMI Sheet (Asbestos-Protected Metal, Insulated) has been developed. Applicable to either roofs or side-walls, providing a flat surface on the interior. APMI is highly fire-resistant—the insulation withstands 1800° F. for one hour. Thickness of insulation is 3/4", 1 1/4", or 1 3/4", average*, as desired. Heat transmission ranges from .32 BTU for the thinnest to .145 for the thickest dimensions. Available only in 2 1/2" corrugated or Mansard sections.

FELT-COTE FLAT SHEET

Flashings, ducts, hoods, ventilators, flat panels, trims, and various formed items for FELT-COTE installations are made from flat sheets, protected in the same manner as corrugated FELT-COTE. Standard width is 36", lengths to 12 feet.

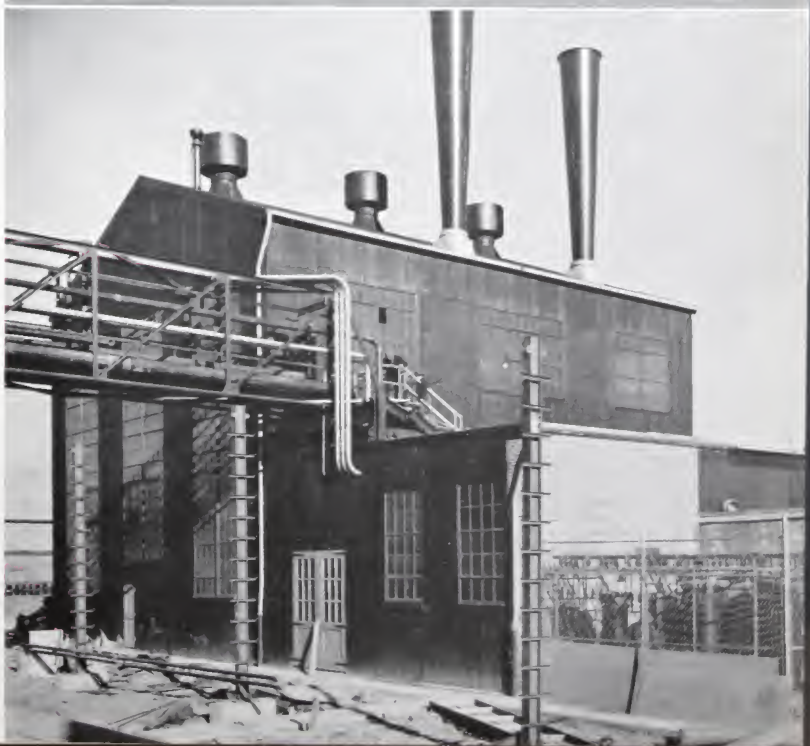
DECK SHEETS FOR BUILT-UP ROOF

Where a corrosion-proof, non-sweating roof of high insulating value is required—whether steep or flat,—suitable decking sheets of FELT-COTE can be supplied for purlin spaces up to 7'-6" (Up to 10' if Long-Span corrugation is ordered). Maximum length of sheets is 12 feet, widths as for standard FELT-COTE. Insulation board of required thickness and built-up roof covering as may be specified.

*Thickness will be less in the trough and more at the peak of each corrugation.



- *Top: Pulp and Paper Mill in Florida —FELT-COTE roofs and siding.*
- *Center: Hangar on important Government Flying Field. FELT-COTE roofing and siding installed January to April, 1940.*
- *Bottom: Oil Refinery. Roofing, Siding, and Ventilators of FELT-COTE.*





● *Over 20 acres enclosed in a steel company rolling mill. Roof and sides mainly of FELT-COTE.*

Felt-Cote

MATERIALS . . . METHODS . . . ADVANTAGES

To the strength and other well recognized merits of corrugated steel, for roofs and siding, durability has been added. This has been done by the use of protective materials, coating processes, and methods of installation which will here be described.

Durability is only one of several advantages contributed by FELT-COTE covering and sealing, as applied to steel sheets. One other effect is thermal insulation. FELT-COTE helps to control interior temperatures at all seasons, and also greatly lessens condensation of moisture on the inside of roof or walls, which might work injury to equipment or to goods in storage or in production.

Not only the main surfaces of every FELT-COTE sheet, inside and out, but also all edges of the sheet and all fastenings by which it is attached to the building in the finished job, are coated and sealed against corrosion. Therefore every piece of FELT-COTE

● *Top: FELT-COTE draftsmen at work.*

● *Below: Steel storage—Asphalt storage—Asphalt stills—FELT-COTE ready for shipment.*

must be designed, patterned, and exactly cut in the FELT-COTE plant, to fit a particular spot on the roof or wall.

Every corrugated sheet is put through a special machine for straightening, in order that when two sheets are overlapped they will come together perfectly. Then when they are drawn down tight, one upon another, the tough, adherent plastic coating forms a durable and effective seal.

Felt-Cote **FIRE-RESISTANCE**

For fire-resistance FELT-COTE conforms to the standards of the National Board of Fire Underwriters. It fulfills the requirements and satisfactorily meets the tests of the Associated Factory Mutual Laboratories, representing 26 leading industrial insurance companies. It has been accepted by Government authorities repeatedly, for use on airplane hangars, ordnance plants, and the like, where avoidance of fire hazards is a major consideration.

FELT-COTE fire-resistant coatings have been developed only after a great deal of research and experiment. The utmost care is exercised in the FELT-COTE laboratories and plant, to make sure that this highly important character is uniformly maintained.

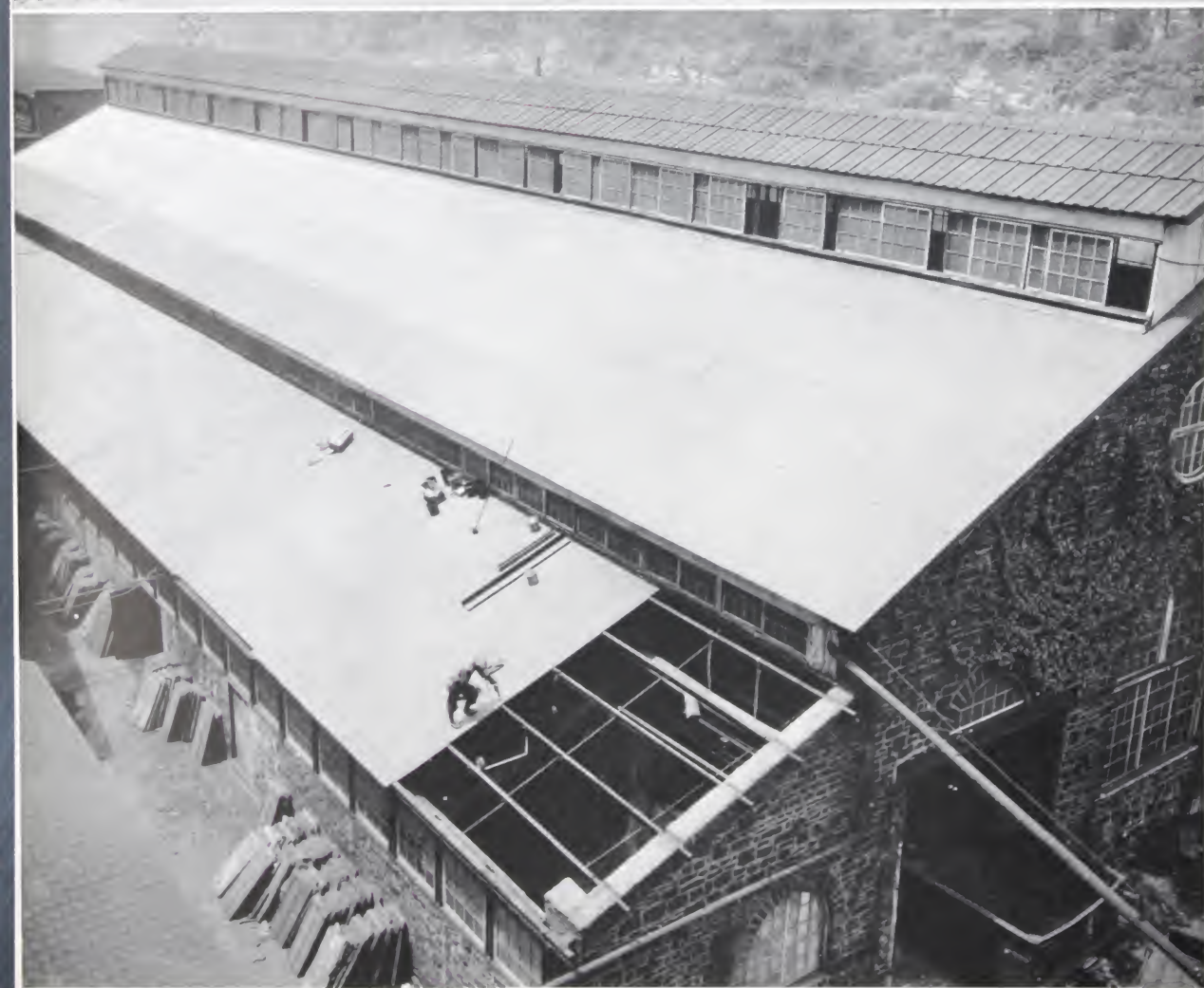
EVERY JOB **ENGINEERED**

Seeing that each FELT-COTE job has to be specially engineered and that the details of engineering design are carried out very precisely in fabrication, it may be inferred that the work of installing FELT-COTE also calls for a degree of expertness. So in fact it does.

● *Bottom: Insulated panels of FELT-COTE as delivered at building site. Insulation attached and panels completely fabricated at FELT-COTE plant.*



● *Steel Strip Mill—FELT-COTE roofs and siding.*



● *Tool-Steel Finishing Mill. FELT-COTE installation in process.*

Special skill in ERECTION



FELT-COTE erection service is regularly offered in all parts of the United States. FELT-COTE roofers are highly skilled mechanics, familiar with the best installation methods for protected metal and with the code of instructions used on FELT-COTE erection design sheets. They can therefore start a job without lost time or lost motion, and can carry it on efficiently, from beginning to end. There is no spoilage or waste of material and no uncertainty as to the final result. Responsibility is unified where they are employed, to the advantage of both user and manufacturer.

Occasionally, however, where the handling of protected metal is well understood, a user may have FELT-COTE applied by his own workers or by an approved local contractor with satisfactory results. A complete erection diagram is furnished by the factory for every such job, and the fullest advice and cooperation will be given. This method is more likely to be favored if the job is small and the location remote.

Another plan is to have a qualified erection foreman supplied by FELT-COTE, and let him supervise the work of local erectors.

Under most circumstances, however, it is advisable to employ the experienced and skilled workers of a FELT-COTE erection crew and let FELT-COTE be responsible for the whole undertaking, from first to last.

(Photographs—Top to Bottom)

- Airplane Repair Shops—recent FELT-COTE installation.
- Alloy-steel Finishing Mill.
- Engine Repair Shop on a Flying Field. FELT-COTE used for roofs and siding.
- FELT-COTE siding on a metal-working plant in an Eastern city.



The Composition of a Felt-Cote Sheet

A great deal of study and experimentation has been carried on, not by one manufacturer alone but by a number of large roofing and building concerns and by some departments of the United States Government, and also a great deal has been learned from similar work abroad, as to economical methods of using steel sheets in exposed places. The problem, of course, was to protect them from corrosion when so exposed.

FELT-COTE therefore has profited from scientific and practical knowledge developed both by its own researchers and also by others, in the last fifty years. FELT-COTE technicians have looked thoroughly into all such knowledge, have by persevering effort improved some of the materials and processes involved, and have incorporated them finally in a standardized product. FELT-COTE is the result.

The substance and qualities that must enter into any such product, and that do enter into the manufacture of FELT-COTE, under the best conditions and controls, may be outlined as follows:

- 1 Special-analysis steel sheet, cleaned and heated before coating; gauge of steel and depth of corrugation sufficient for safely bridging required purlin spaces.
- 2 Asphaltic coat on both sides of steel core, sealing it against corrosion. This coat, applied hot by dipping and rolling, must be of adequate and uniform thickness. The asphalt must be of a relatively high degree of purity and of a quality inert to the acids and corrosive fumes that are generally encountered. It must be strongly adhesive, yet must be immune to effects of temperature under the conditions of service.
- 3 Asphalt-impregnated long-fibre asbestos felt, bonded to the asphaltic undercoat by heat and pressure—this felt rolled onto both surfaces of the sheet, edges of felt turned and sealed, ends extended beyond those of the steel, and tightly sealed together.
- 4 Weatherproofing coat, factory-applied over the felt, on both sides. (The asphalt compound used on FELT-COTE sheets, a product of special distillation and combination of ingredients, is tough, elastic, and highly durable in exposure to the elements.)

In the case of FELT-COTE, the anti-stick material sprayed over the waterproofing coat is itself insoluble in water and therefore constitutes an extra protective coat, contributing a measure of added service life. It requires no washing off if special painting, for signs and the like, is to be done on the building. For certain purposes a double anti-stick coating is applied, at small extra cost. In all cases, paint applied to bituminous materials must be of a special nature, on which full information will be given to any user.

PROTECTED METAL

STRAP FASTENINGS, CLIPS and BOLTS

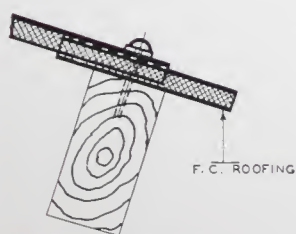
Straps of asphalt-membrane-protected steel are the standard fastenings by which FELT-COTE is attached to a building. Unprotected metal could obviously not be relied on for comparable service under varying conditions. FELT-COTE protected-metal fastenings are essentially of the same structure and have the same durability as FELT-COTE sheets.

Straps are regularly made of $\frac{3}{4}$ x No. 18 U.S. gauge stock, a proper membrane, and bituminous coating material. Bar clips and special hook fasteners, where such are required by the formation of the framework, are made from heavy steel of proper gauge to suit conditions, and are effectively protected.

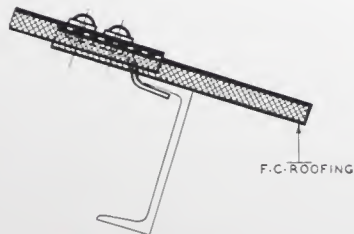
Mushroom-head bolts of $\frac{1}{4}$ " diameter, sherardized or cadmium-plated, are used, set with asphalt-asbestos washers against both interior and exterior surfaces of the sheets, in combination with metal washers according to standard details, for holding clips and strap fasteners in place. So used, they make a hermetic seal of every punch hole. After tightening, all bolt heads are thoroughly coated with heavy fibrated asphalt plastic.

Special drive-screw nails, heavy curved-head nails, and various other attachments are used on occasion as called for by the nature of the construction, always with thorough attention to coating and sealing for a permanently tight job.

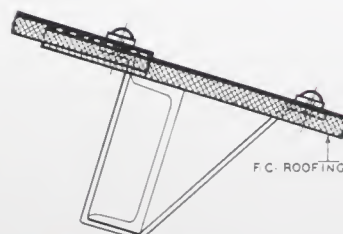
If explosions are at all apprehended, the attachment of a FELT-COTE cover to its frame can be so engineered that although strong enough for all normal requirements, it will yield to interior pressure and the sheets will free themselves from the structure with minimum damage.



● Curved-Head Nail



● Z-clip and Bolts



● Strap and Bolts

Factory-Formed FLASHINGS

All flashings, gable trim, ridge roll, etc., are precisely designed, piece by piece, cut from the same material as the sheets, shaped and formed for absolutely water-tight installation. All flashings have at least a four-inch overlap at every end joint, and joints will be cemented if so specified.

Where corrugated and flat surfaces come together, around skylights, along gutters in valleys, and at every point where leakage might otherwise occur, specially formed closures are provided to reduce air infiltration or heat loss.

Details of all such accessories are submitted to the purchaser for approval, in advance of fabrication.

Ventilators, Skylights, Roof Decks, etcetera

Ventilators — stationary, motor-fan, or continuous-ridge types, and also ventilating monitors — louvres (fixed and operating), ducts, and hoods, and decks for built-up roofs are all fabricated of standard or special FELT-COTE materials, according to requirement. Special circulars on such uses of FELT-COTE are offered to supplement the present book, and will be mailed on request.

Thus a complete service of engineering design, fabrication, and construction, on external coverings for roofs and sidewalls, is offered under one undivided responsibility, to the advantage of the user. Specific inquiries are solicited.

● *Finishing and Pickling Building of a Steel Strip Mill.*



How to Specify

ASBESTOS PROTECTED METAL ROOFING AND SIDING

•

The following paragraphs describe the method of manufacturing FELT-COTE, and also serve as a set of specifications under which buyers may secure parallel bids from competitive sources:

1. SCOPE — The proposal submitted shall provide for furnishing all material and equipment and performing all necessary labor to install, complete, asbestos-protected metal roofing and siding as indicated on the drawings.

2. ASBESTOS-PROTECTED METAL (APM) — The material and method of installation that may be standard with each individual manufacturer, meeting the general requirements hereinafter set forth, will be accepted; subject to approval of

A. The material shall be a mill-fabricated product consisting of a base or core of sheet steel with surfaces and edges protected from deterioration in the manner hereinafter described.

B. Such base or core shall be of annealed sheet steel, of such thickness as to support the required load, supporting purlins being spaced as shown on drawings; except that when APM is to be installed over solid wood backing, the thickness shall be .025.

C. The surface of the sheet steel shall be thoroughly cleaned so as to remove all grease, moisture,

oxides or other impurities that might interfere with the bonding of the protective covering to the sheet steel. Resquared steel only shall be used to insure accuracy to size.

D. A coating which is of uniform thickness, gas- and moisture-proof, shall be obtained, applied on sheets by immersing in an asphaltic compound having high adhesion and low susceptibility factors. Both the sheets and the asphaltic compound shall be uniformly heated and maintained at the proper temperature. While sheets are still hot, protective asphalt-impregnated asbestos felt shall be applied under pressure and heat, in such manner as to bond the felt thoroughly to the coated steel sheet. During this process, the felt is to be turned around the edges of the steel sheet and sealed with hot asphaltic compound, and the ends of the felt over-running the ends of steel core are to be sealed to each other by hot asphaltic compound. The sheets while hot are to be "cured" before application of the final coating.

E. The surfaces, edges and ends of the asbestos felt on both sides of the sheet shall be uniformly covered with a coating of special bituminous compound applied at the factory by means of hot rolls, at a temperature of not less than four hundred (400) degrees F. The coating shall weigh not less than fourteen (14) pounds per hundred (100)

sq. ft. of asbestos-protected metal. This coating shall be water-repellent and corrosion-proof.

F. The asphalt used in this coating shall be processed to reduce inflammability. It shall meet the requirements of the National Board of Fire Underwriters and of the Associated Factory Mutual Laboratories, with respect to fire-resistance. Tests of this property shall be as previously determined by the National Bureau of Standards.

G. The completed covering shall not be adversely affected by natural changes of outdoor temperature. It shall not chip or crack in extremely cold weather nor become soft and run in extremely hot weather.

H. Note to Specification Writer: Of the following specifications, use whichever you find applicable to the particular job.

Trough-shaped ("V") corrugations — Sheets shall be formed with trough-shaped corrugations having relatively flat surfaces and dimensions standard with the manufacturer furnishing the material, with the provision that minimum depth of corrugation shall be $1\frac{1}{2}$ ".

2½" corrugated roofing — Roofing sheets shall be 33" wide after corrugating with 2½" corrugations, nominal depth of corrugations 9/16", laps furnished one up and one down, at opposite edges.

2½" corrugated siding — Siding shall be not less than 33" wide after corrugating, with 2½" corrugations, both laps down at opposite edges.

Mansard-type corrugations — Sheets to be mansard style, not less than 33" wide with alternating flat sections approximately 6" wide, and ribbed sections approximately 2" wide, both laps down at opposite edges.

I. Finished sheets shall be carefully inspected for complete protection and any unprotected edges shall be properly sealed before shipment from the factory.

J. Sheets shall be prevented from sticking together in transit by application of an insoluble anti-stick of character suitable to receive specially prepared paint, of those types especially adapted for use over bituminous surfaces. Sheets to be passed through a drying oven after application of anti-stick. Sheets are to be crated, if handling or transportation conditions make it advisable.

K. Fasteners shall be of the following types, one or another of these types being used at each point as required by construction. Asphaltic-and-membrane-protected metal straps, ¾" by No. 18 U.S. gauge.

Steel bar clips, ¾" by ¼"

Steel rivet clips, ¼" by 1" (seldom used).

All fasteners are to be complete with necessary ¼" special cup head sherardized or cadmium-plated steel bolts, sherardized or cadmium-plated steel nuts, sherardized or cadmium-plated steel washers, and asbestos felt washers. Steel-rivet clips, bar clips or protected-metal straps to be finished to correspond with color of sheets.

Fasteners of special design shall be furnished for special construction conditions. Fasteners of all types shall be used in conformity with the manufacturer's instructions.

Manufacturer shall furnish a sufficient number of fasteners to provide a minimum of two (2) fasteners per sheet where end laps occur on purlins, one (1) fastener per sheet for intermediate purlins, one (1) bolt for not over every 17" of spacing along side laps of sheets.

L. Flashings, cap flashings, ridge and other trim required to make APM watertight shall be of the same product as hereinbefore specified, unless otherwise shown by drawings, and shall be formed, cut and shaped as required for a complete and watertight installation. Where any corrugated surface adjoins a flat plane, the openings at the corrugations shall be closed across the corrugated sheet with either a composition closure or a closure of APM (at manufacturer's option).

M. Color of Asbestos-Protected Metal shall be:

Note to Specification Writer: State whether black or maroon color, grey, green or aluminum painted. If aluminum-painted sheet is desired, priority must be obtained, and delivery will depend on such priority.

3. INSTALLATION. APM sheets, together with fastenings, etc., shall be erected and installed in accordance with manufacturer's instructions; as shown by approved prints, using the types and sizes of tools and punches recommended by manufacturer. Complete details to be submitted for approval prior to fabrication.

A. Where it is necessary to cut finished sheets at the time of erection, the exposed edges shall be immediately sealed and protected by a sealing compound as supplied by the manufac-

turer of the sheets. Any portions of sheets damaged by handling and erection are also to be repaired.

B. Roofing sheets shall be laid with corrugations in the direction of the pitch.

End-lap of roofing sheets to be 6". If pitch does not exceed 3" in 12", all laps shall be cemented.

Side-lap of roofing shall be as follows:

Trough-shaped corrugations—Standard side lap of approximately 2¼".

2½" corrugated roofing—Standard side lap of 1½ corrugations.

Mansard type corrugations—Standard side lap of one corrugation.

C. Siding shall be applied with corrugations vertical, end lap of 4", and one corrugation side lap.

D. On roofing, where pitch is 3" or less in 12", all laps, both sides and ends, shall be given a coat of an approved joint sealer before the sheets are secured in place. Laps of siding are not to be so treated unless shown on drawings.

E. Ridge Cap, flashings and trim shall be installed in accordance with the drawings, complete in every detail, assuring watertight construction. Exterior boltheads of black or maroon sheets to be coated with fibrated asphaltic coating; with painted sheets, the bolt heads are to be painted in matching color.

F. On specification requiring over 25,000 square feet of APM, the following will apply: The material shall be installed by this manufacturer's own forces in accordance with the specifications and details as submitted by them and approved by

Men employed as skilled mechanics must be thoroughly skilled and experienced in their trade. Roof helpers, sheet unloaders, sheet pullers, sheet passers, and other unskilled or semi-skilled labor may be employed locally as required for the individual job. A competent foreman employed by this manufacturer shall supervise all work under this heading.

On specifications requiring less than 25,000 square feet area of APM, installation may be made by others in strict accordance with these specifications and erection diagrams approved by

4. SAMPLES of typical products in their respective sections and finishes under this specification, shall be submitted, if required.

Note to Specification Writer: Most APM jobs call for no painting. If sheets are to be painted, include the following:

5. PAINTING ON APM SHEETS and fittings shall consist of complete shop-applied paint on

2 surfaces, edges and ends

1 surface, edges and ends—exterior

1 surface, edges and ends—interior

} Indicate which will be required.

A. Paint shall be prepared in accordance with APM manufacturer's own formula.

B. Application of paint may be by any suitable method which provides a reasonable, uniform color and coverage. Paint must be oven-dried after application.

C. During erection of APM, any damage to shop-applied surface coating shall be touched up and made equal to adjacent APM shop-applied surface coating prior to acceptance of building.

Any such touch-up or repair of surface coating shall be considered as part of the "shop" application process.

Note to Specification Writer: IF INSULATED CONSTRUCTION (APMI OR THE EQUIVALENT) IS DESIRED, add the following:

6. SPECIAL INSULATED ROOFING AND SIDING (APMI):

A. Roof and sidewall units shall be as manufactured by American Steel Band Company, Pittsburgh, Pennsylvania, or an approved equal within the limitations of this specification. Any reference to manufacturers' names or brands is not intended to constitute a proprietary specification, as equal consideration will be given to other equivalent products, subject to the approval of

A-1. Exterior sheets of roof and sidewall to be 2½" corrugated, Asbestos-Protected Metal, to consist of a steel core of gauge as shown on drawings, asphalt bond coat, asbestos felt with edges turned, factory-applied external bituminous weatherproofing, and insoluble anti-stick, exte-

rior color to be (indicate whether black, maroon or painted exterior.)

A-2. All necessary flash and trim to be of APM, with composition closures as required.

B. Insulation: Wherever APM sheets, whether corrugated or plain, are exposed on the building interior, except for ventilators, suitable insulating material of kind and thickness specified herein shall be applied by the manufacturer of the APM sheets. This insulation is preferably to be attached to the APM sheets at point of manufacture, but may be applied as a field operation.

B-1. Insulation is to be applied to an average thickness of (indicate either $\frac{3}{4}$ " or $1\frac{1}{4}$ " for the roof, and (indicate either $\frac{3}{4}$ " or $1\frac{1}{4}$ " for the sidewalls. (Thickness below crests of corrugations will be greater than average specified, and less below valleys of corrugations; the exposed interior surface to be relatively flat; resulting in average thickness of $\frac{3}{4}$ " or $1\frac{1}{4}$ " for roof and $\frac{3}{4}$ " or $1\frac{1}{4}$ "—state which—for side walls over interior area.) Such insulation must act as a homogeneous filler for all corrugations, so that no objectionable voids exist between the corrugated surfaces of APM sheets and adjoining surfaces of insulation. Insulation must be firmly bolted to the APM sheets.

Suggested Purlin and Girt Spacings with Felt-Cote

Gage	2 $\frac{1}{2}$ " Corrugated		Long-Span	
	Roofing		Siding	Roofing
	Pitch over 4" in 12"	Pitch not less than 2" in 12"		
24	5' 0"	4' 9"	5' 3"	7' 0"
22	5' 9"	5' 3"	6' 0"	7' 9"
20	6' 6"	5' 9"	7' 0"	8' 6"
18	7' 6"	6' 9"	8' 0"	10' 0"

Data for other sections or applications furnished on request. The above is variable with snow, windloads, etc., but may be used as an average guide.

If interior of insulation is to be painted, state "Interior of insulation to have a factory-applied coat of paint, followed by field 'touch-up' as required." NOTE: Priority must be given to secure delivery of aluminum paint.

B-2. Insulation and material having properties outlined below are approved under this specification:

a—Insulation to be rigid, self-form-sustaining, preferably consisting of a mixture of wood fibre and vermiculite.

b—Material must be tested for fire performance as a completed building unit (including the APM cover sheets) by the National Bureau of Standards.

c—Conductivity of insulation used, in BTU per hour, per square foot, per inch thickness, per degree of difference in temperature (Fahrenheit), shall not exceed .36.

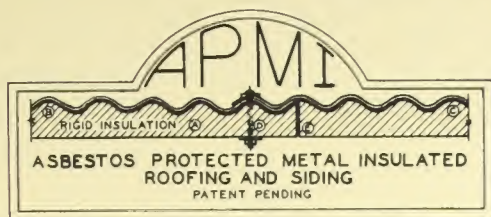
C. Fasteners as recommended by the manufacturer, shall be used. All flashing and trim of Asbestos-Protected Metal required to make a thoroughly watertight job shall be included.

D. Installation: Installation is to be made by the manufacturer's own forces in accordance with the best practice of the manufacturer, and details approved by

Shipping Weights per Square of Felt-Cote

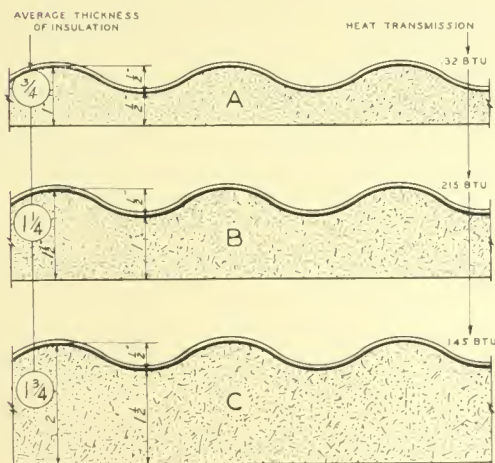
2 $\frac{1}{2}$ corr., Mansard or Flat Sheets		
Gage	Uncrated	Open Crate
24	185	200
22	210	225
20	245	260
18	300	315
Long Span 5.3" corr.		
24	220	245
22	250	275
20	285	310
18	350	375

Insulated FELT-COTE—APMI



- (A) Rigid insulation
- (B) Felt-Cote Asbestos Protected Steel
- (C) Asphaltic Bond
- (D) Bolt assembly, corrosion resisting
- (E) Plastic sealed joint.

HEAT TRANSMISSION—ROOF AND WALL SECTIONS
OF
A.P.M.I.



TOP CURVED SURFACES EXPOSED TO WEATHER
BOTTOM FLAT SURFACES REPRESENT INTERIORS

COLOR—The standard color of APMI is black FELT-COTE with natural-color insulation board. For architectural exterior effects APMI is available with attractive maroon-color FELT-COTE or paints, etc. The insulation board on the interior may be painted, if desired.

FINISHES—For excessive moisture conditions APMI is available with special surface treatment of the insulation applied at the factory. Gypsum plasters, magnesites and other inerts may be applied to the insulation if desired.

In response to a great need for a light-weight, relatively low cost, permanent type building covering with high insulating properties—APMI (Asbestos Protected Metal, Insulated)—has been developed.

Combines the long life of FELT-COTE with the well known insulating properties of a rigid insulation board, having special highly fire-resistant qualities.

Is available in attractive finishes.

Provides moderate control of acoustical effects.

Can be furnished with special surface treatments, for improved resistance to moisture and acids.

Can be furnished with painted interior, including aluminum (aluminum available on special priority only).

Is used for either roofs or sidewalls; see details on inside pages.

Due to the reduced thickness (as compared with non-bearing masonry walls) APMI provides extra space in the building, without extra structural steel cost.

The use of specially formed insulation in APMI which matches the contour of the corrugations, provides many desirable features not present in other insulated constructions. The flat interior is very adaptable to plastering, painting, extra acoustical treatment, and the like.

FIRE-RESISTANCE—The highly fire-resistant qualities of FELT-COTE APMI are a result of special fire-retardant insulation board, developed after much research, corrugated on one side to serve as a homogeneous filler for all corrugations, thus eliminating objectionable "flue action" between the FELT-COTE sheets and the insulation. Fire tests of FELT-COTE APMI, as a completed building unit, performed by leading testing bureaus, attest to its superior fire-resistant qualities.

USUAL PURLIN AND GIRT SPACING

Gage APMI	Roofing-Pitch 4" in 12"	Roofing-Pitch 2" to 4" in 12"	Roofing-Pitch 0" to 2" in 12"	Siding
22	5'9"	5'3"	5'0"	6'6"
20	6'6"	6'3"	5'9"	7'3"
18	7'6"	7'3"	6'9"	8'3"

INSULATING VALUES

Expressed in coefficient of heat transmission, in BTU per hour, per square foot, per inch thickness, per degrees Fahrenheit difference in temperature.

3/4" Avg. Thickness .32 BTU

1 1/4" Avg. Thickness .215 BTU

1 3/4" Avg. Thickness .145 BTU

INSULATING PROPERTIES — SPECIAL INSULATED FELT-COTE - APMI

For the majority of mill building operations, the insulating value of standard FELT-COTE is sufficient. For more severe conditions, FELT-COTE Insulated has been provided. Retention of heat in winter, exclusion of heat in summer, and avoidance of moisture condensation are accomplished in satisfactory degrees by proper specification of Insulated FELT-COTE, designated as "APMI" (Asbestos Protected Metal-Insulated). APMI is described on another page. Still greater and more special provision can be made for extreme conditions, with special combinations of materials. While heat transmission should be calculated for each job specifically, the following table of heat-transmission co-efficients may be used as a guide for comparison. *Co-efficients are given in B.T.U. per sq. ft., per hour, per degree Fahrenheit, of temperature change, for average conditions.*

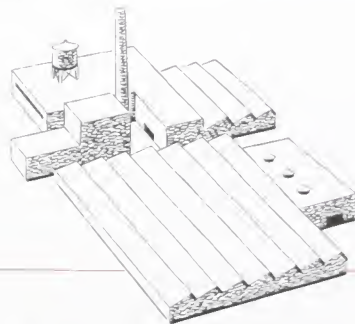
Without built-up roof	Including built-up roof		
	No insulation	1 layer of ½" Board	2 layers of ½" Board
FELT-COTE .89	.80	.28	.20
Corrugated Steel—Black or galvanized 2.13	.83	.37	.23
Steel Deck	.83	.37	.23
1" Wood Plank .48	.48	.29	.21
FELT-COTE "Sandwich construction" 2 sheets with insulating board between.			
With ½" Board .26			
With 1" Board .18			
FELT-COTE "Type Y"—Insulation board spanned between steel on interior, FELT-COTE to exterior.			
With ½" Board .37			
With 1" Board .24			
FELT-COTE APMI—Corrugated insulation attached directly to sheets on interior.			
"A"—¾" average .32			
"B"—1¼" average .215			
"C"—1¾" average .145			

If FELT-COTE APMI used as deck, with roofing applied over APMI insulation, approximately 10% better efficiency than figures at left may be used.



● Hangar at a Government Airport. Roof and siding is of FELT-COTE.

One Flawless Fabric Jackets the Whole Building



FELT-COTE sheets, applied by FELT-COTE methods, need no supplemental treatment on the building. Every piece is triple-coated on both sides and sealed on all edges. Every punch-hole is hermetically closed. Every bolt-head is completely covered with weather-resisting material. The sheets, lapped and pressed together by tightly drawn bolts, adhere one to another and make a permanent seal of every joint. There is no place for water to get in or corrosion to start. There are no cracks or gaps where drafts and heat losses may occur. The outside cover of the whole building has become one unbroken fabric.

Mention is made elsewhere of the process by which FELT-COTE sheets, after corrugation, undergo special straightening, so that when they are laid on the job, overlapping one another, the joints may be smooth, firm, and tight. This is only one example of the thoroughness with which every detail is looked after, until the last stroke is given to the completely covered building.



● *Roofs and Ventilators of FELT-COTE in large industrial plant.*

● *Coal-cleaning plant—FELT-COTE used for roofs and siding.*



Felt-Cote is Good-Looking

Nothing can be more neatly arranged than the sheets that make up the external cover of a FELT-COTE building. Every unit, down to the smallest piece of trim or flashing, is where it is, as it is, in anticipation of a particular exposure or a particular structural requirement. From so thorough fitness, quite naturally, the FELT-COTE-covered building takes on a ship-shape, sound, and finished appearance, and is altogether a satisfying thing to look at. To the owner of a property on which FELT-COTE has been used, it becomes an object of pride.

How Important is Color?

By its original nature, FELT-COTE is black. On roads and roofs and other structures, the valuable and lasting properties of high-grade bituminous materials have become so well known that if FELT-COTE is allowed to appear in its true character, it commands respect. It is as little in need of disguise as honest red brick or good gray stone. Year in and year out, the greater part of all protected metal sheets, of whatever make, are black when laid, and their good appearance is permanent.

On strictly practical grounds, there is but one reason for preferring a painted FELT-COTE sheet to the original black, which is that it can be made more reflective of light. The availability of colors will presently be stated.

There are surroundings, however, where

black is ruled out, and there are preferences that will not be reconciled to black, in whatever surroundings. In such a case, the owner is well advised to consider maroon as his first alternative. A considerable percentage of all FELT-COTE installations are maroon-colored, the pigment being red oxide of iron, which is incorporated in the substance of the asphalt coating material on the external surface, at slight added cost. Maroon FELT-COTE weathers well and gives the building a permanent color.

A special war-time requirement of color should be mentioned—the need of camouflage effects on buildings that might be landmarks or objects of attack. Maroon, gray, and green coatings are most in favor. Correspondence on individual projects is invited.

Factory-Applied Paints . . . Foil

Governed by personal taste, by established local preference, or by special need of a reflective surface, there are users who must have some alternative to either black or maroon. For such, gray, green, and aluminum paints,* factory applied, offer freedom of choice. The paints used are the best that research has developed, for even weathering and relatively long life when applied to bituminous coating materials.

Whoever specifies these colors, however, knows that they will need renewal from time to time. He is willing to incur that necessity, and to assume a maintenance cost from which black and maroon FELT-COTE sheets are free, in order to obtain the effect that he desires. He knows, too, that for his purpose this occasional minor expense is unavoidable, whether he uses FELT-COTE or some other brand of protected metal.

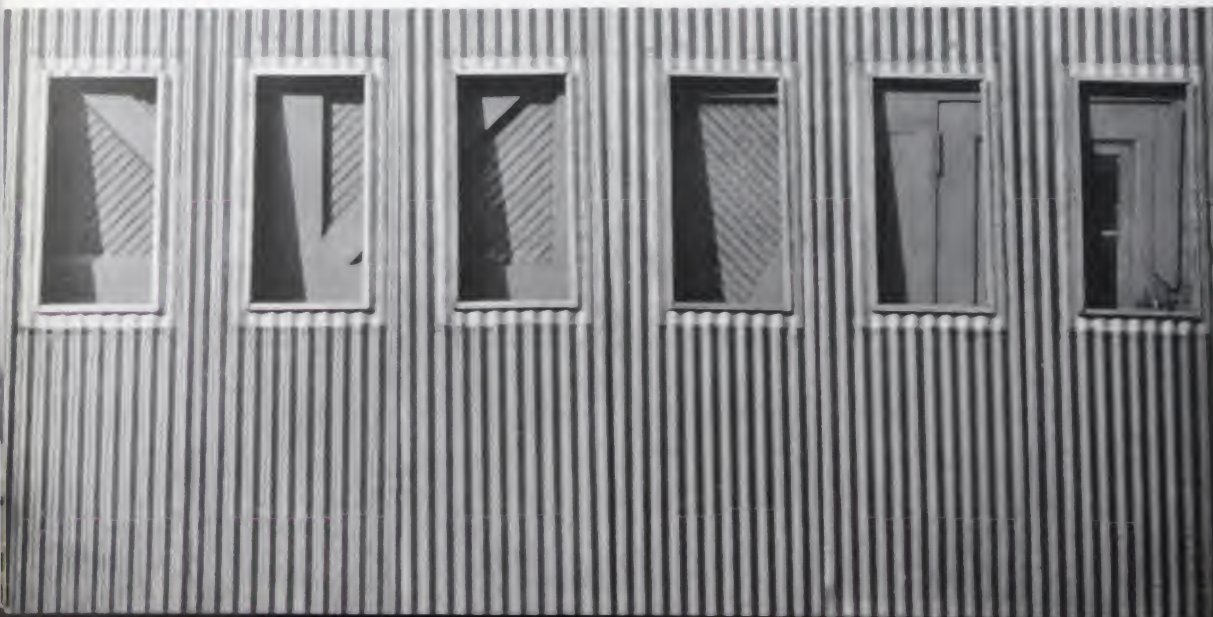
Still further, for quite special applications, aluminum-covered FELT-COTE sheets have been developed,* the aluminum used being in the form of foil, added as an extra coating over the standard protected sheet on

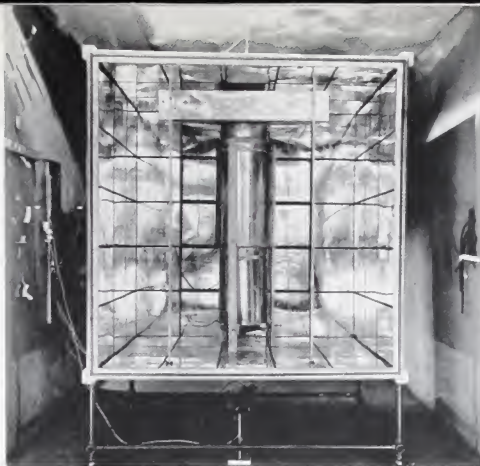
the exterior surface only. Aluminum-coated sheets, like factory-painted sheets, are necessarily sold with a qualified recommendation. It is understood that the "skin" of bright metallic foil is only semi-permanent.

In general, the FELT-COTE policy, with respect to color, or to other specifications, is realistic. The superlative merits of FELT-COTE, within its range of greatest usefulness, are emphasized wherever FELT-COTE is sold. Modifications and departures, if they involve immediate cost, or prospective maintenance cost, or any sacrifice of efficiency, are presented as nearly as possible in their true light. FELT-COTE will go as far as is practicable to meet the desires of any user. Unless he is very clear as to his choice of some other color, either black or maroon is the factory recommendation. Frank discussion is invited. Competent architectural as well as chemical engineering advice will be brought to bear if necessary.

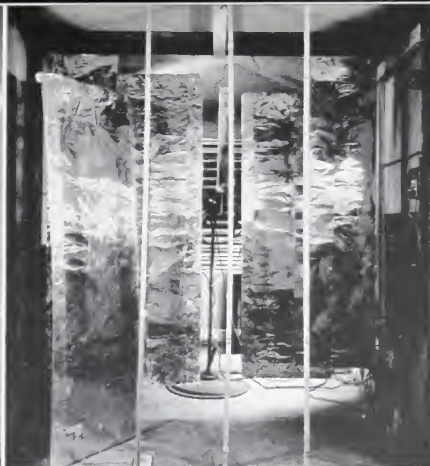
**Aluminum temporarily unavailable because of war restrictions.*

● *Special Window Installation of FELT-COTE without need of framing members.*





• *Guard Box and Heater—viewed from Cold Room*



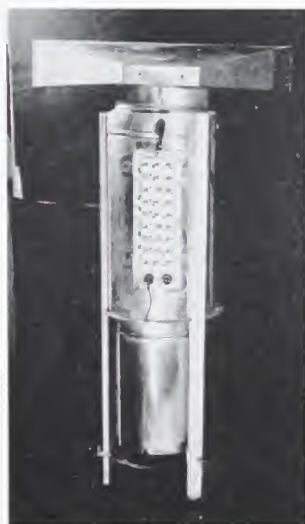
• *Cold Box — showing Radiation Shields*



• *Guard Space Heater*

• *Guard Box Heater*

• *Test Controls*



• *Tests of Thermal Transmittance by Pittsburgh Testing Laboratory.*

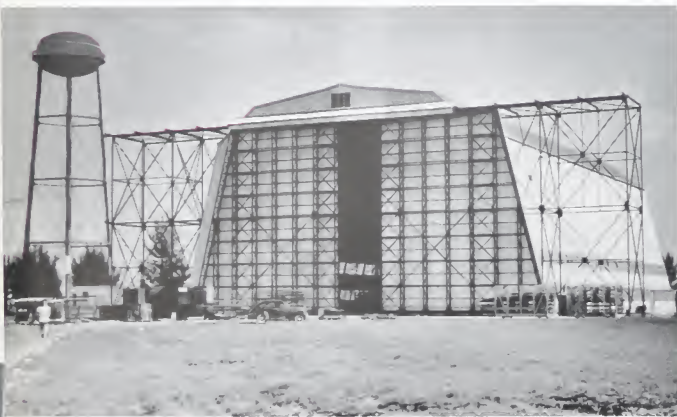
Felt-Cote PRODUCTION CONTROL

In summary, the following controls are exercised in the manufacture of FELT-COTE to assure uniformity and satisfactory service.

- 1 Careful choice of materials, under exacting laboratory tests.
- 2 Control of viscosity in coating, by regulation of heat.
- 3 Rigid plant inspection and careful handling to avoid damage.
- 4 Thorough checking by extraction of test sheets during every run.
- 5 Subjection of such sheets to both laboratory and actual service tests, for maintenance and constant improvement of standards in FELT-COTE manufacture.

First Cost...Maintenance...Economy of Use

At the moment of completion, in a representative case, a FELT-COTE covered roof or side wall has involved a larger investment than a galvanized steel one, prices for the latter being normal. The difference is largely accounted for by the more detailed, careful manner in which designing and installation work are done, in anticipation of the long service that FELT-COTE affords. This initial difference becomes very slight, however, at the end of six months or so, when galvanized sheets are given their first painting; and if at the end of another year a second painting is done, the extra initial cost of FELT-COTE will have been equalized.



● Above: Front View, one of many Hangars covered with FELT-COTE for the U.S. Government.

● Below: Interior, same Hangar as above.



Thereafter, for as long as the life expectancy of your FELT-COTE — twenty, thirty years or more—economy is all on the side of the more lasting material.

When re-roofing is taken into account, actual records prove the wisdom of "paying more now to save more then." Besides the direct cost of material and of application, the indirect cost of delayed or interrupted production in the building affected must be taken into account. Counseled by experience, those companies that have long been users of Asbestos Protected Metal are the largest users now. They find it easier to justify the higher first cost of FELT-COTE than the accumulating costs of less efficient coverings.

Some years ago one of the steel companies, itself a manufacturer of galvanized sheets, had a roofing job to do on one of its large plants. A careful comparison was made between the economy of using ordinary galvanized metal of good quality and using FELT-COTE. Comparing the best forecast that could be made for each type of material, including maintenance over a twenty-year period, the engineers arrived at a total cost of \$322,000 for galvanized sheets and \$234,000 for FELT-COTE, no actual replacement being anticipated in either case. On the long term, the advantage in favor of Felt-Cote will be seen to have been about 25%. Possible heat saving on any parts of the plant that might be heated would have increased the difference, if such savings had been estimated and taken into account; but the case for FELT-COTE was considered strong enough without them and action was recommended accordingly.

Every undertaking will involve different factors, and comparative costs of materials are not constant from year to year, but the example just described will give a good preliminary understanding in advance of specific inquiry. Such inquiry is always welcomed by the FELT-COTE management.

Heat-Saving is Money-Saving

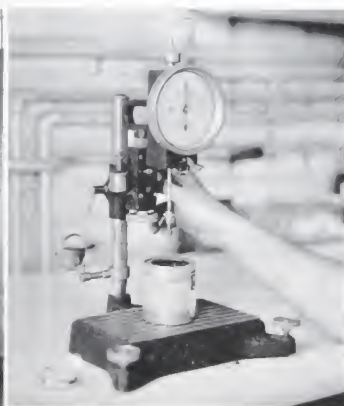
On the point of thermal insulation it should be noted that a FELT-COTE roof of the most-used gage and of standard coating treatment has a heat-transmission rate of .89 BTU as compared with 2.13 BTU for galvanized sheets. A comparative study of a group of industrial buildings indicated that with a galvanized roof it would take 820 tons of coal to maintain satisfactory temperatures through an average winter, but only 600 tons would be needed if FELT-COTE were applied. The fuel saving computed is over 25%. The actual ratio of practical advantage would admittedly be variable but the thermal efficiency of FELT-COTE being as stated, its importance for a given project can be reasonably well estimated.

Fuel saving is, of course, not the only advantage of insulating efficiency. Relative freedom from condensation of vapors, to the detriment of the building itself or of its contents, is often more important and has been touched upon elsewhere.

For uses that require insulation to a higher degree than regular FELT-COTE provides, FELT-COTE specially insulated sheets are recommended. They will be found described on another page.



• Penetration Test (Resistance of asphalt-asbestos coat to piercing.)



• Penetrometer for testing resistance to penetration at varying temperatures.



• Melting-point Test in Asphalt Laboratory.

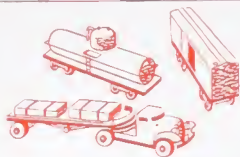
• Tensile Test for strength of Asbestos Felt.

• Weighing Test for asbestos felt before coating.

• Laboratory Still for oxidizing asphalts in same manner as is done in the plant.



The Felt-Cote PLANT and Its Operations



A group of modern factory-type buildings well situated at Carnegie, Pa., in the Pittsburgh district, comprise the main plant in which FELT-COTE sheets and fastenings are manufactured.

Steel sheets of special analysis, from nearby rolling mills, are delivered, flat, by train or truck. Semi-refined asphalt comes in railway tank cars, is steam-heated to flowing condition, and then is pumped into big FELT-COTE stills for special treatment. Heavy rolls of asbestos felt are unloaded from box cars on a siding, to the "bond-coat" mill.

Steel, asphalt, asbestos — these three materials, the principal "makings," of FELT-COTE, are here combined into the finished protected-metal roofing and siding with which FELT-COTE users are familiar.



Receiving an Order

Mention has been made of the precision with which all material for any job is designed and cut to fit. Since that function comes before actual fabrication, let us now deal with it briefly.

On the basis of architectural drawings and specifications as given by the customer, a work-progress sheet is made up by the FELT-COTE sales and planning departments, in consultation. This sets down the requirements of the job in detail, and provides for each necessary step in advance.



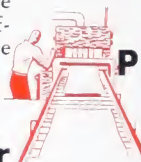
Designing Staff

The architect's drawing, with general specifications of material, an itemized estimate sheet, and the work-progress chart that has been made up, are together sent to the designing section. There, in some cases, preliminary drawings may be made to show what surfaces will be covered and to indicate a typical treatment, for tentative approval of the customer. But this is only a beginning. Before actual fabrication can be started, a detailed set of designs for the FELT-COTE application will have to be made. And before that can be done, it will be necessary to obtain from the customer detailed drawings of the steel framework to which the FELT-COTE sheets will be attached.

The importance of such thoroughness is understood when the fact is known that each individual clip, strap, or other fastening unit must be either specially designed, or if standardized must at least

be specified and coded, for exact and perfect fitting to the structural member that is to carry it, at the particular point where it is to be applied. Often more engineering time is devoted to the requisite fastenings than to the FELT-COTE sheets themselves, flashings included. Not only must all sheets be patterned, piece by piece, down to the smallest, but each must be provided with its own appropriate attachment.

In some cases, FELT-COTE designers — one man or a corps of several — go to the site of the proposed building and there make complete designs, subject to final checking and approval of the engineers at the FELT-COTE plant.



Production in the Shop

When a job has been checked, detailed, and rechecked, it goes into production, scheduled according to agreement with the user, having "priorities" in view, so as to assure, among other things, prompt installation on arrival at destination.

Now let us trace the actual physical progress of such an order as it goes through the FELT-COTE plant.

Semi-annealed sheets of special high-strength steel, of proper width and of varying lengths up to 12 feet, oil-free, clean, and dry, are the basic material for FELT-COTE.

Such sheets, after cleaning, are subjected to heat as they enter the first coating machine, to drive off any residual moisture or burn away any light deposit of organic dust. So conditioned, they go down into an asphalt bath and receive their first protective coat — the bonding coat. This bath is maintained at a uniform temperature, which results in proper viscosity and so governs the amount of asphalt that will adhere.

Emerging from their first bath, the sheets pass between rolls under controlled pressure. At regular intervals, specimen sheets are taken out and tested for weight.

As to the nature of the bonding coat, it is of a specially compounded air-blown asphalt, very adhesive, yet of high enough melt point to endure the temperatures to which it may be exposed on a roof. Within relatively wide ranges, it will be little affected by either heat or cold.

As the steel sheet emerges from its asphalt bath, and while the asphalt is still hot, two layers of long-fibre, high-strength asbestos are applied, one above, one below, and pressed well into the bond coat by pairs of rollers. The asbestos felt used is of a high degree of purity, and is thoroughly impreg-

nated with asphalt of suitable, uniform composition.

As the sheet moves along in the machine, the felt now tightly bonded to both surfaces, the two edges are sealed by turning the felt down over them and rolling it flat. The ends are sealed in like manner by means of an extension of felt that has been made to over-run the length of each sheet. Speaking more plainly, as the sheets pass along one after another in the machine, there is an interval of two inches between each one and its successor, but there is no corresponding break in the felt layers above and below. Since the felt is continuous and stretches across the gap, all that is necessary now is to cut this extra felt midway between two sheets and make a seal by pressing the felt well down into the hot asphalt. For the cutting process, a special shear is employed.

All sheets are inspected as they issue from the bond-coating machine, any imperfect ones rejected, and the others, cut to desired lengths, passed along for further treatment.

Next is the final weatherproofing machine. Here sheets pass through a hot bath of a special bituminous compound, a roll underneath revolving in a tank of the material while quantities of the same material are pumped upon the upper side. The coating material for this purpose, necessarily different from the bonding coat, is compounded of special ingredients to give it suitable properties for direct exposure to the weather and to handling.



• Insulated FELT-COTE Siding on interior walls of Detinning Plant. Note the light-reflecting quality of the insulation.

The FELT-COTE weatherproofing compound was developed after years of research and experiment. It is not a commercially available product but is produced at the FELT-COTE plant, in the company's own stills, by experienced technicians, on whose "know how" much of the success of FELT-COTE depends. Applied at a uniform, controlled temperature and pressure, this third coating generously covers all surfaces, edges, and ends, making of every sheet a hermetically sealed unit. It is jet-black in color (unless maroon or some other color is specified) and assumes a characteristic crinkly surface from the effects of temperature in the coating and cooling processes. It is extraordinarily durable and tough and of superior resistance to weathering.

A last surface treatment is the application of a non-soluble anti-stick material, which to some degree has the effect of a fourth protective coat. The most specific purpose of this coat, however, is to prevent the sheets from sticking together at any time during transportation or handling. For some uses, a double coat of anti-stick is required, at slight extra cost, one such use being in preparation of the sheets for field painting in special colors.

Emphasis is laid on the non-soluble quality of the anti-stick material used, because it will not cause unsightly streaks when subjected to rain on a building and will not require special preparation or costly removal as soluble anti-stick may do, in case signs are to be painted or other painting is to be done upon the building after the sheets are in use.



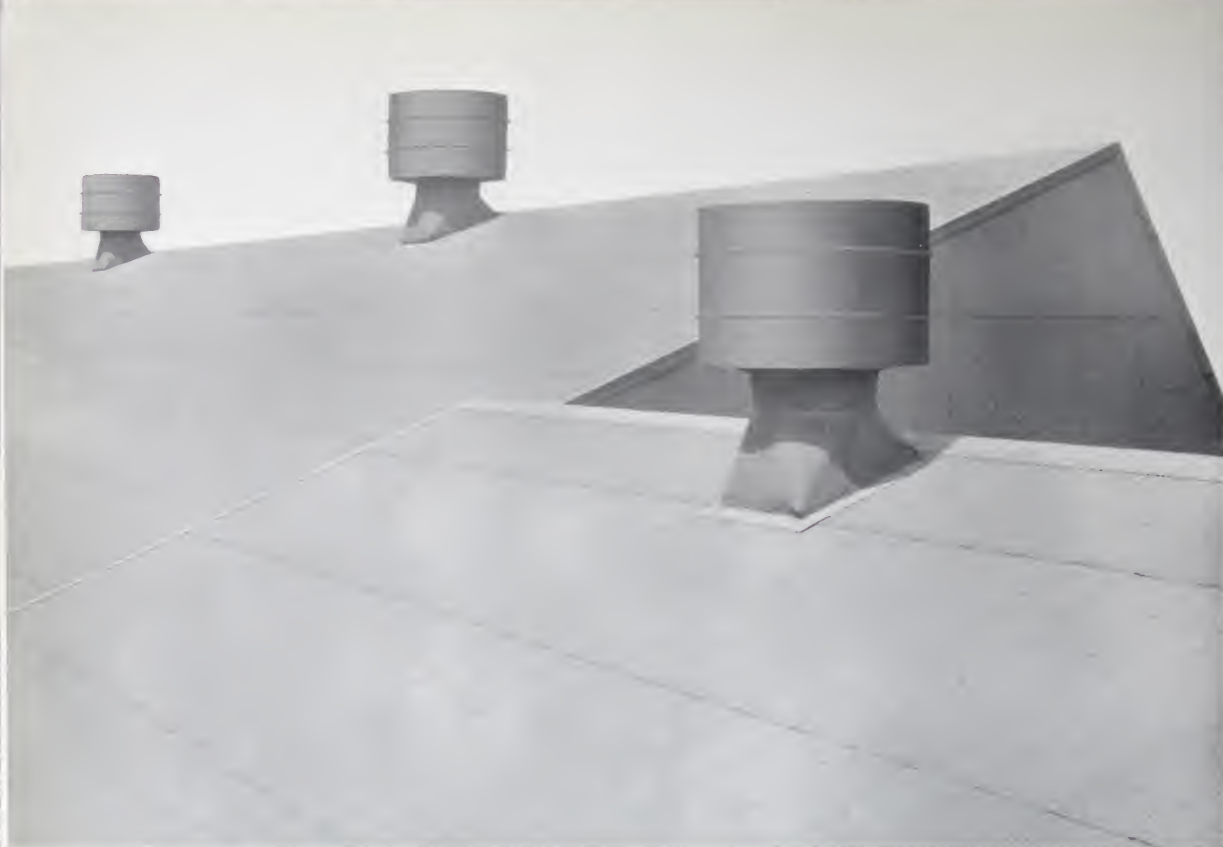
Final Details

Every FELT-COTE sheet is individually handled and inspected after the last surface treatment has been given, to make sure that no imperfect material is released.

Wherever a FELT-COTE sheet is cut to narrower measure, or cut to pattern, for covering fractional or irregular surfaces, for flashing, or for whatever purpose, the cutting is done at the time of the bond-coating process. The resulting exposed edge is taped and hot coated, then the sheet is put through the final weatherproofing and anti-stick operations, giving the edges protection equal to that on all other parts of the sheet.

All clips, straps, or other fasteners designed for the job in hand, are effectively protected against corrosion; and fastenings so protected have proved as serviceable as the more costly stainless steel accessories formerly used.

After corrugation by the standard method, all FELT-COTE sheets are put through a special corrugation straightening machine, to adapt them for precise and perfect lapping on the roof or wall.



• *Typical Shipsbane Appearance of a FELT-COTE Job.*

The Manufacturers of Felt-Cote

The American Steel Band Company has been a manufacturer of steel products for over fifty years. Limited at first to such output as its name would signify, it began before long to diversify, however, and among the added products that found favor, protected-metal sheets for roofs and siding were noteworthy. So much was this the case that a separate division of the company was set up for the manufacture of such sheets and eventually the name FELT-COTE was adopted.

The FELT-COTE business has grown till it now employs over 500 workers and its

management and technical staff include men of the most thorough technical training and the broadest experience in the manufacture of roofing materials and in building construction, both under FELT-COTE auspices and in other well known connections.

As to the ground of confidence that any customer may have, perhaps the best assurance will be found in the character of the concerns that have been users of FELT-COTE—some of them again and again as new projects came up for consideration. The most searching inquiry will be welcomed.

Points of Felt-Cote Superiority

- 1** Available. Adequate plant capacity for quick execution of "rush" projects — under priority control.
- 2** Speedily installed because, piece by piece, it is cut to size and pattern at the factory, each piece for a particular detail of the job in hand.
- 3** Factory-applied. Nationally operated erection service offers complete installation on definite time schedules.
- 4** Economical in covering relatively wide purlin spaces, with ample margins of safety, because of high-strength steel.
- 5** Permanently fastened to structural members, by non-corroding, protected-metal straps, or heavy steel bar clips.
- 6** Admirable in appearance by reason of engineered design, precise application throughout.
- 7** Perfectly weathertight because of "one-piece," firmly sealed, integrated application.
- 8** Of high insulating property — minimizes condensation and sweating — reduces fuel costs.
- 9** Fire-safe — meets requirements of Associated Mutual Laboratories and of National Board of Underwriters.
- 10** Inert to acids, fumes, vapors, and gases commonly found in industrial areas.
- 11** Immune to injury by expansion, contraction, or vibration.
- 12** Durable — reduces maintenance practically to zero, in most cases, for long periods of time.
- 13** Economical — freedom from maintenance trouble results in a net saving — lower cost per unit, per annum.
- 14** Satisfactory. Manufacture, design, fabrication, erection, all under one control — one responsibility.
- 15** Standardized — enables a user with several plants to adopt uniform methods of construction and maintenance.

THESE COMPANIES USE **Felt-Cote**

A complete list of the users of FELT-COTE would occupy several pages. The names below have been chosen as representing diversity of interests and requirements and importance in their respective fields. On specific inquiry, as much information will be given as FELT-COTE is free to divulge.

Allegheny Ludlum Steel Corp.	Oil Well Supply Co.
Aluminum Co. of America	Otis Steel Co.
American Agriculture Chemical Co.	Pennsylvania Railroad Co.
American Chain & Cable Co.	Phelps-Dodge Corp.
American Cyanamid Co.	Pittsburgh Crucible Steel Co.
American Locomotive Co.	Pittsburgh Plate Glass Co.
Bethlehem Steel Co.	Pittsburgh Steel Co.
Carnegie-Illinois Steel Corp.	Republic Steel Corp.
Celanese Corp. of America	Joseph T. Ryerson & Son, Inc.
Chrysler Corp.	Socony Vacuum Oil Co.
Corn Products Refining Co.	Standard Tank Car Corp.
Dow Chemical Co.	Swift & Company
Ford Motor Co.	Union Bag & Paper Corp.
General Motors Corp.	Weirton Steel Co.
Goodyear Tire & Rubber Co., Inc.	Westinghouse Electrical & Mfg. Co.
H. J. Heinz Co.	West Virginia Pulp & Paper Co.
Ingersoll-Rand Co.	Wheeling Steel Corp.
Inland Steel Co.	Wickmore Spencer Steel Co.
Jones & Laughlin Steel Corp.	Winton Engine Corp.

FELT-COTE has been used from time to time on many structures built for the United States Army, the United States Navy, and other departments and branches of Government.

Your Inquiries are Invited

While a correct general understanding of FELT-COTE materials and methods has presumably been given in these pages, there are no doubt special circumstances affecting your case. What points would you like to have more fully developed? What question is in your mind as to the suitability and advantage of FELT-COTE for your particular requirement? If you will say what information or proposal would be of interest, it will be the pleasure of the FELT-COTE management to answer fully and promptly.

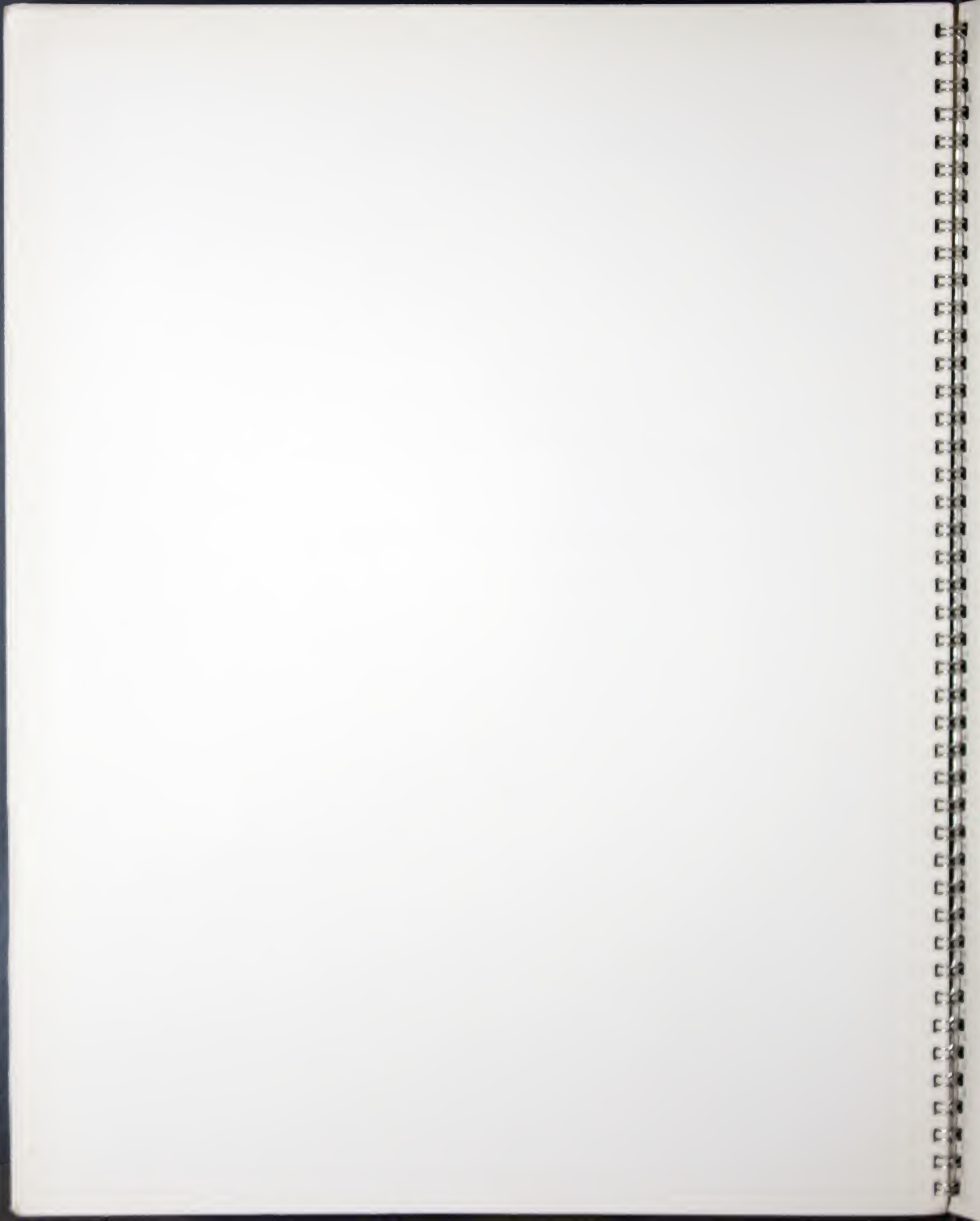
AMERICAN STEEL BAND CO.

Sales Offices, PITTSBURGH, PA.

Established 1891

Plant, Carnegie, Pa.

SALES REPRESENTATIVES IN PRINCIPAL CITIES



2